



## Introduction

# EOSDIS Evolution at the Goddard Earth Science Data and Information Services Center (GES DISC)

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March 30, 2007

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## Outline

- Background on EOSDIS Evolution
- Evolution activities at the GES DISC
- AIRS data in the evolution system
  - Version 4, Version 5



## EOSDIS Evolution Background

- In early 2005, NASA embarked on an EOSDIS Evolution Study
- Address multi-faceted goals/issues:
  - Manage archive volume growth
  - Improve science need response and data access
  - Reduce recurring costs of operations and sustaining engineering
  - Update aging systems and components
  - Move towards more distributed environment
- A vision for the 2015 timeframe was developed to guide conduct of study (<http://eosdis-evolution.gsfc.nasa.gov>)
- EOSDIS Evolution “Step 1” Plan approved by NASA Headquarters in late 2005.
- GES DISC IPR conducted February 2006



## Basic Approach

- Reduce Maintenance and Operations
  - Reduce off-shift operations (lights out)
  - Reduce number of different systems (V0, V1, ECS...)
- Use dedicated archives for different measurements
  - Enables measurement (mission)-specific engineering
  - Reduces risks
  - Enables fine-grained cost control
- Evolve beyond the EOSDIS Core System (ECS)
- Get all the data online
  - Eliminate data latency
  - Enables services, machine-to-machine access, access via standard protocols
- Move to commodity systems
  - Reduces maintenance and technology refresh costs
- Reuse proven software (S4PA)



# S4PA Software System

- Simple Scalable Script-based Science Processor (S4P) Archive
- A simplified software system to automate ingest and data management for online data
- Based on successful S4P kernel
  - Operating since 2001 as part of S4PM
  - Reused for several processing systems
  - Implements a factory assembly-line paradigm (or DFD)
- S4PA
  - Currently supporting V0 data (2004) and TRMM data (2005)
  - Written in Perl
  - Compact: ~20 KSLOC



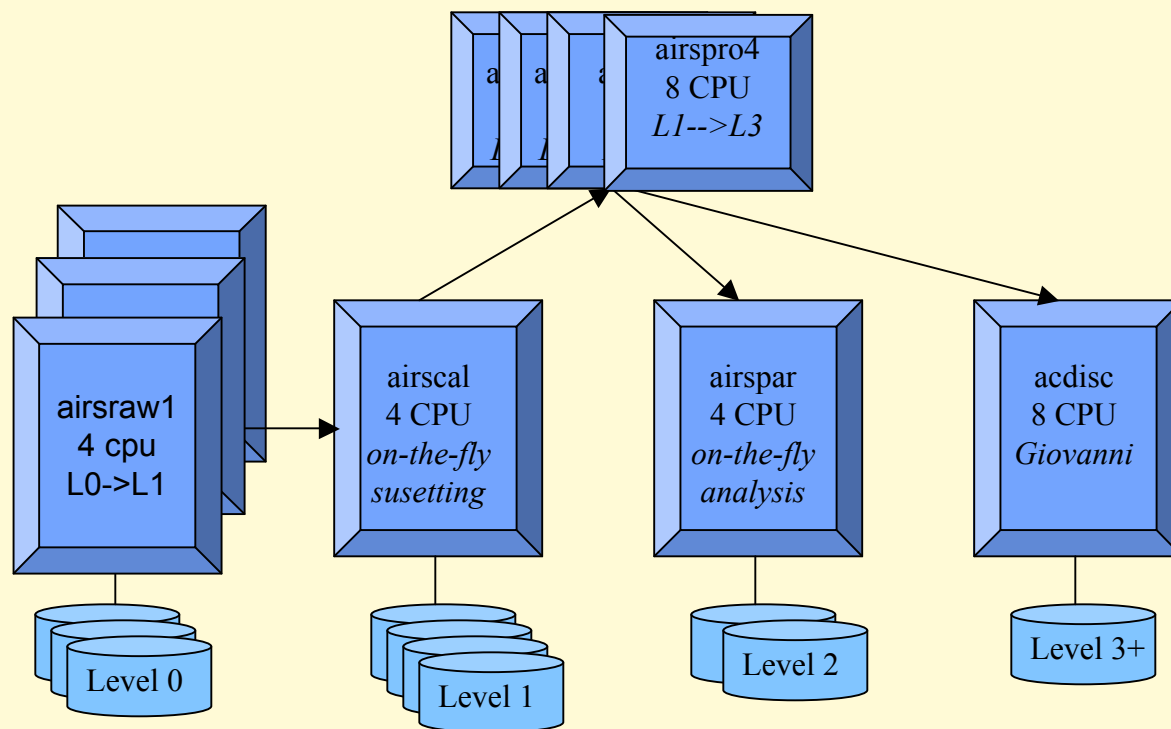
## Evolution: DAAC to DISC

### **Consolidate GES DAAC data holdings into one system (S4PA)**

- **Features:**
  - Transition of Aqua AIRS, Aura (HIRDLS, OMI, MLS), SORCE and heritage data sets to S4PA
  - Transition MODIS archive and L1 processing to MODAPS
  - Phase out of ECS in early FY08 timeframe
- **Benefits:**
  - Reduction in operations costs due to elimination of multiple systems
  - Reduction in archive volume
  - Reduction in sustaining engineering costs due to use of simpler, scalable software and reduction in dependency on COTS products
  - Increased system automation due to single system, simpler operational scenarios
  - Improved data access due to planned use of increased on-line storage and commodity disks/platforms



# AIRS DISC Architecture



## Insulated Level-Slice Architecture

- + Optimized hardware for each task
- + Simple reprocessing scheme
- + User access segregated from processing machines
- Significant data movement (Production Network)



## V4 Status and Plans

- Produce and archive 5 year record of V4 L2/L3 data
  - Through August 2007
- Migrate V4 L2/L3 data from ECS to S4PA
- Planned phase out of access to V4 L1 data Dec 2007 (ECS phase out)
- Restrict access to V4 L2/L3 data once V5 record is complete
  - Avoid user confusion



## V5 Status and Plans

- All L0 data migrated from ECS to S4PA
- L0 data actively archived in S4PA
- V5 L1 Reprocessing underway
  - 39 X peak rate
  - 25-30 X rate sustained
- V4 L2 benchmarked at 15 X on new system
- Target rate of 8-12 X sustained
  - 6 months to reprocess 5 year record
  - May 2007 startup – November 2007 completion



## Conclusion

Thank You!

Questions?